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Experiments with Different Techniques for Combination of Gravity Field Wavelength Components for Geoid Determination in Egypt

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The paper attempts to find out an optimum combination of gravity field wavelengths in the geoid computation process for Egypt in the framework of the remove-restore technique. Different approaches for such a combination of the wavelengths exist. The modified Stokes' kernel with different approaches has been suggested to possibly combine the local data signals with the global geopotential earth models. The window technique (Abd-Elmotaal and Kuehtreiber, 2003) has been suggested to get rid of the double consideration of the topographic-isostatic masses within the data window. Both techniques have been used in computing a gravimetric geoid for Egypt. The available gravity, height and GPS data for the current investigation are described. The EGM2008 geopotential model has been used. A wide comparison between modified Stokes' kernel with different approaches and window techniques has been carried out within this investigation in the framework of the geoid computation. The comparison is made on two different levels; the residual gravity anomalies after the remove step and the computed geoid signals before and after scaling to the GPS/leveling geoid.